

***AETHUS NIGRITUS* (F.), A PALEARCTIC BURROWER BUG  
ESTABLISHED IN EASTERN NORTH AMERICA  
(HEMIPTERA-HETEROPTERA: CYDNIDAE)**

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*Abstract.*—*Aethus nigrinus* (F.), a Eurasian burrower bug, was first collected in North America at single localities in Delaware in 1977 and in Connecticut in 1979; it is here reported from additional localities in Connecticut, and from New Jersey, New York and Pennsylvania. This introduced cydnid is briefly described, and its dorsal habitus, diagnostic external characters, and male genitalia are illustrated. The habitat and associated host plants are given, and North American locality records are listed and mapped. Several selected keys to North American genera of Cydnidae are modified to include *Aethus*, an Old World genus.

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*Aethus* Dallas, an Old World genus comprised of at least 19 species (Stichel, 1961), is distributed throughout most of the Palearctic and a portion of the Oriental region. All North American species previously assigned to *Aethus* belong to the genus *Tominotus* Mulsant and Rey (Froeschner, 1960).

The burrower bug *Aethus nigrinus* (F.) was detected recently in the Western Hemisphere (Hoebeke, 1978, 1980), based on specimens submitted (to ERH) for identification in support of the USDA-APHIS "High Hazard Pest Survey" program. A single adult male was taken in a soybean field at Townsend, Delaware (New Castle Co.), on 8 June 1977; a second male, from forage at Waterford, Connecticut (New London Co.), on 22 August 1979.

In this paper we confirm the establishment of *A. nigrinus* in the eastern United States, give additional locality records from New England and the Middle Atlantic states, map its distribution, and briefly describe its habitat and associated host plants. An adult diagnosis and photographs of the adult habitus and other distinguishing adult characters are provided, and selected keys to North American Cydnidae (i.e., Froeschner, 1960; Slater and Baranowski, 1978; and McPherson, 1982) are modified to include *A. nigrinus*.

***Aethus nigrinus* (F.)**

*Aethus nigrinus* is a common Old World cydnid that ranges throughout most of Europe, the Soviet Union, and Asia (Stichel, 1961). Although its habits have not been well studied, this fossorial bug is generally found in sandy areas such as dunes and fields and is known to occur up to 15 cm deep (Otten, 1956) at the roots of weeds like *Artemisia campestris* L., *Achillea*, and *Calluna* (Stichel, 1925),



Fig. 1. Habitus of *Aethus nigrinus*, dorsal aspect. Scale line = 1.0 mm.

and grasses, particularly *Corynephorus canescens* (L.) Beauv. (Stichel, 1961). Kerzhner (1967) characterizes *A. nigrinus* as a "polyphagous" and "sometimes injurious" species. Adults overwinter about 5 cm deep in loose sand and become active on warm days in early spring (Schumacher, 1916). Mating occurs during April and May, and eggs are laid in loose clusters in the sand near their host plants (Hertzel, 1982). *A. nigrinus* sometimes occurs in large numbers and occasionally injures crop plants, e.g., lupine, potatoes, and rye (Schumacher, 1916; Reclaire, 1936). Other *Aethus* species also cause sporadic crop damage—*A. indicus* (Westwood) to germinating corn in Indonesia (Kalshoven, 1950) and *A. laticollis orientalis* Ghauri to pearl millet, *Pennisetum typhoides* (Burm.), and to wheat in sandy areas in central India (Ghauri, 1975).

*Aethus nigrinus* is the only species of *Aethus* known to be established in the

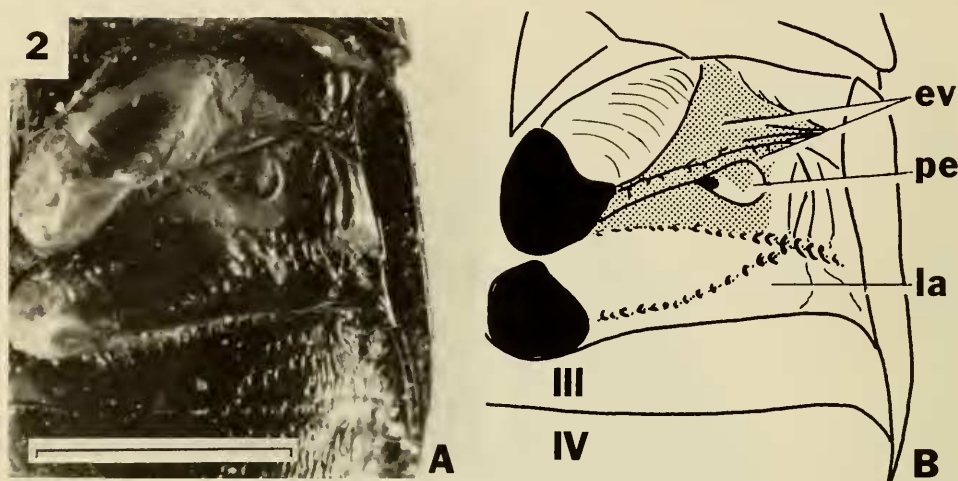


Fig. 2. Mesopleuron and metapleuron of *Aethus nigratus*, ventral aspect. A, photograph of area. B, line schematic of same, highlighting diagnostic structures. [ev, evaporatoria; pe, peritreme; la, lamella. Terminology after Froeschner, 1960.] Scale line = 1.0 mm.

Western Hemisphere. During 1978–79, *A. nigratus* was intercepted from a shipment of roots of *Glycyrrhiza* sp. (Leguminosae) from China that was destined for Pennsylvania (USDA, 1981). In addition, at least two other species of *Aethus* have been intercepted at U.S. ports of entry since 1944. *Aethus indicus*, widespread in Eurasia, has been intercepted on numerous occasions in cargo destined principally for Hawaii, California, Washington, Alaska, and the eastern U.S. (including Delaware, Maryland, New Jersey and New York) (USDA, 1946–1981), and during 1971–72, *A. pilosus* H.-S. was found in soil in a shipment from the Soviet Union and destined for New York (USDA, 1974).

Distribution and habits in North America.—In addition to the original collection of *A. nigratus* in Townsend, DE and Waterford, CT, we provide the following localities in eastern North America (Fig. 5), based on the examination of museum specimens and our own collecting.

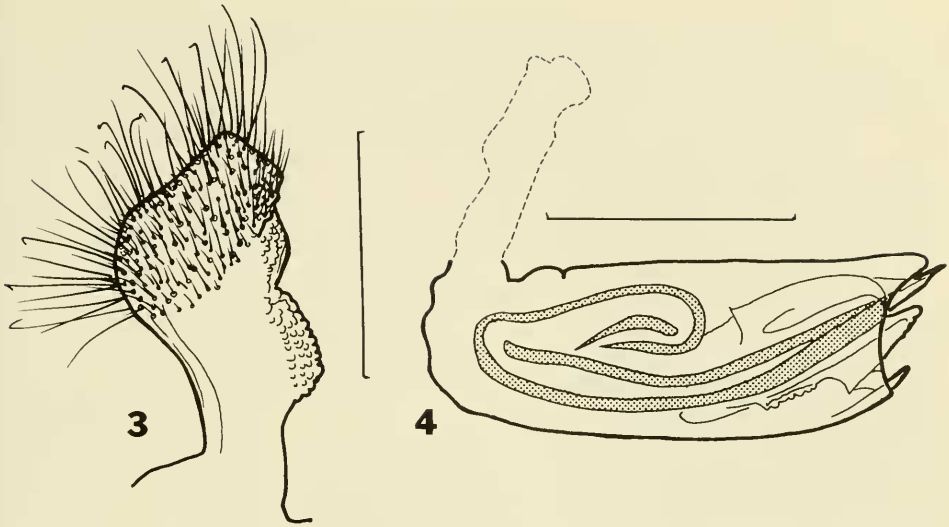
*Connecticut*: New London Co., Stonington, Barn Island, 12 August 1976, Slater, Ford, and O'Donnell. Tolland Co., Storrs, 30 May 1977, D. Leston; Storrs, Univ. of Conn. campus, 29 May 1983, ERH and AGW; Mansfield Center, 9 July 1979 and 25 April 1980, J. A. Slater. Middlesex Co., Old Saybrook, 28 May 1983, ERH and AGW.

*New Jersey*: Burlington Co., Lebanon State Forest, 4 mi. N of Chatsworth, 11 May 1969, G. C. and K. Eickwort.

*New York*: Nassau Co., Tobay Beach, 19 May 1975, G. C. Eickwort.

*Pennsylvania*: Dauphin Co., Harrisburg, 2 June 1983, AGW.

At a landfill at Old Saybrook, Connecticut, we collected more than 20 adults of *A. nigratus* under rocks of various sizes and in the gravelly, sandy soil up to several centimeters deep. Most of the cydnids were taken near roots of the dominant grasses present in the landfill, namely *Festuca capillata* Lam., *Panicum lanuginosum* Ell., and *P. clandestinum* L. Two adults of a native cydnid, *Amnestus spinifrons* (Say), also were collected under rocks at the same site.



Figs. 3–4. *Aethus nigrinus*. Scale line = 0.25 mm. 3, Right clasper of male genitalia, mesal aspect. 4, Aedeagus of male genitalia, lateral aspect.

On the campus of the University of Connecticut (Storrs) specimens of *A. nigrinus* were collected under mats of grasses overlying the edge of a sidewalk and were observed crawling across the sidewalk. The one Pennsylvania specimen collected also was observed running across a sidewalk; Gulde (1933) mentions a similar habit (“Wege laufend”) for *A. nigrinus* in Europe. The single specimens known from New Jersey (Pine Barrens) and New York (Tobay Beach on Long Island) probably were collected in sandy areas that appear typical for the species in the Old World.

Recognition.—Adults of *A. nigrinus* (Fig. 1) closely resemble those of several native cydnids occurring in eastern North America (especially species of *Microporus* Uhler, *Tominotus*, and *Melanaethus* Uhler), but may be differentiated by the following diagnosis: Dark piceous-brown, with hemelytra often rufous-brown; body length 4.0–5.2 mm; anterior margin of head between eyes with a submarginal row of long setae and short, erect pegs (Fig. 1); peritreme of scent gland channel forming apically a large, nearly circular, partly polished loop (Fig. 2); metapleural evaporatorium (Fig. 2) extensive, occupying more than half of sclerite, and nearly reaching base of metapleural lamella posteriorly; and clasper and aedeagus of male genitalia as in Figs. 3 and 4.

We have modified several selected keys to the North American Cydnidae to include *A. nigrinus*. The two regional works chosen contain updated keys, are popular among users, and encompass the fauna of eastern North America. In addition, the key in a monograph of the cydnid fauna of the Western Hemisphere is modified to reflect the presence of a newly introduced taxon in the hemisphere.

A key to the Cydnidae of the eastern United States by Slater and Baranowski (1978) has been modified, beginning with their couplet #6 (p. 36):

- 6. Scent gland channel forming a loop surrounding a ventrally visible pore, the outer end broadly rounded. Fig. 32, and Fig. 2 herein ..... 8



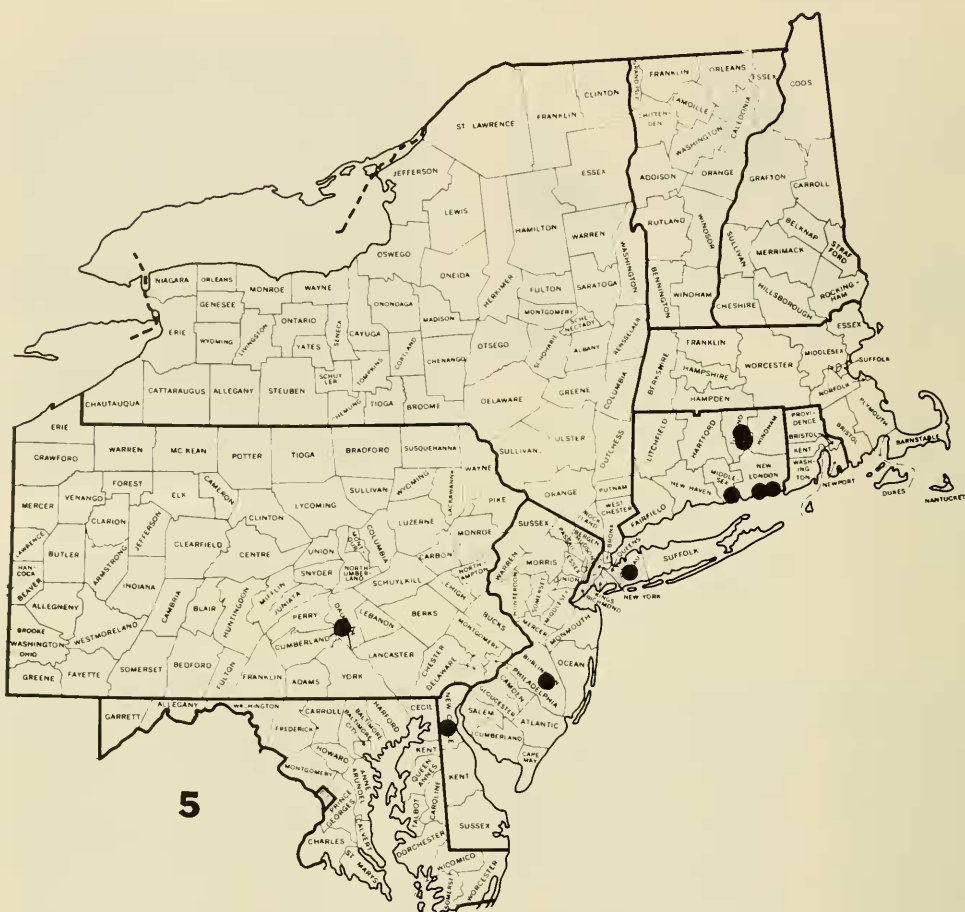


Fig. 5. Distribution of *Aethus nigratus* in eastern United States. Map shows portions of New England, New York, Pennsylvania, New Jersey, Delaware, and Maryland.

- 6a. Scent gland channel not forming a loop, but subacute at outer end, pore visible posteriorly, not ventrally. Fig. 33 ..... *Tominotus*
7. Terminal process of scent gland channel flat, expanded posteriorly as a partially polished flap. Fig. 34 ..... *Melanaethus*
- 7a. Terminal process of scent gland channel neither expanded nor flat. Fig. 35 ..... *Dallasiellus*
8. Metapleural evaporatorium very limited, just outlining peritreme, not approaching metapleural lamella posteriorly ..... *Microporus*
- 8a. Metapleural evaporatorium more extensive, occupying more than half of sclerite, nearly reaching base of metapleural lamella posteriorly. Fig. 2 herein ..... *Aethus*

McPherson's (1982) key to the Cydninae of Northeastern North America, starting with his couplet #2 (p. 29), is modified as follows:

2. Metapleural evaporative area just outlining peritreme, not approaching metapleural lamella posteriorly ..... *Microporus* Uhler (p. 30)

- 2'. Metapleural evaporative area larger, occupying more than half of supporting plate and reaching metapleural lamella ..... 2a.
- 2a. Head in front with submarginal row of long hairs and short, erect pegs (Fig. 1 herein) ..... *Aethus* Dallas
- 2a'. Head in front with submarginal row of widely spaced hairs only .....  
..... *Melanaethus* Uhler (p. 31)

Finally, a key to the Cydnidae of the Western Hemisphere by Froeschner (1960) is altered to include *Aethus*; couplet #7 (p. 381) is modified to read:

- 7. Terminal process of peritreme scoop-shaped or auricular (Fig. 95), or nearly circular (Fig. 2 herein) ..... 7a
- Terminal process of peritreme flat, simply expanded posteriorly as a more or less polished lobe (Figs. 96, 97), osteole opening posteriorly, not conspicuous ventrally ..... *Melanaethus* Uhler (p. 421)
- 7a. Peritreme terminating apically in a free-edged, truncated auricle (Fig. 95), with osteole opening at its base ..... *Onalips* Signoret (p. 415)
- Peritreme terminating in a large, differentiated, free-edged, circular loop (Fig. 2 herein), with osteole opening at its base ..... *Aethus* Dallas

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#### NOTE

#### *Metrioptera roeseli* (Hagenbach), a European Katydid Found for the First Time in Pennsylvania (Orthoptera: Tettigoniidae: Decticinae)

*Metrioptera roeseli* (Hagenbach, 1822) is a European decticine katydid accidentally introduced into Canada sometime between 1945 and 1951. It was first reported in the vicinity of Montreal and Ville St. Laurent (Urquhart and Beaudry. 1953. Can. Entomol. 85: 78-9). Kevan et al. (Ann. Entomol. Soc. Quebec 7: 70-86, 1963) documented its further spread through eastern Canada and reported capture of *roeseli* for the first time in the United States (New York: Harrigan's Corners and Meacham Lake). Vickery (Ann. Entomol. Soc. Quebec 9: 165-71, 1965) mapped its distribution in Canada and the United States, and suggested that although collected only in New York State, *M. roeseli* probably would extend its range into Vermont and Pennsylvania. To date, however, no specimens have been reported from those states. This note documents the first capture of a single short-winged female in Pennsylvania. The specimen was collected in Wayne Co., 1.5 mi. N. of Newfoundland on VII-17-1982 by Gary Hevel and is in the collection of the National Museum of Natural History, Washington, D.C.

*Metrioptera roeseli* is similar in form to *Orchelimum* species but is brown with black and green markings on the lateral lobe of the pronotum. It occurs in both macropterous and brachypterous forms (in which the tegmina are only half as long as the abdomen). It is graminivorous, feeding especially on both wild and cultivated timothy grass (Vickery et al. 1974. Lyman Entomol. Mus. Res. Lab. Memoir 1: 1-204.) but is unlikely to be economically important as a pest.

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